

USSR DESCRIPTION OF INVENTION CORRESPONDING TO AUTHOR'S
CERTIFICATE ISSUED BY THE PEOPLE'S COMMISSARIAT OF HEAVY INDUSTRY

(Soviet Patent No. 51206)
publ. 30 June 1957

L. S. Genin
A. M. Koloskov
V. M. Kamm
N. M. Solomatin
V. G. Khomyakov
I. M. Yakimenko

8 August 1950

SECRET

~~SECRET~~

USSR DESCRIPTION OF INVENTION CORRESPONDING TO
AUTHOR'S CERTIFICATE ISSUED BY THE PEOPLE'S COMMISSARIAT OF
HEAVY INDUSTRY

Application under No 166922 made on April 6, 1935. Published on June 30, 1937.

"Appliance for Equalising the Pressure of Gases in Two Separatory Columns Communicating at the Bottom or Two Electrode Compartments of an Electrolytic Cell" by L. S. Genin, A. M. Koloskov, V. M. Ramm, N. M. Solomatin, V. G. Khomyakov, and L. M. Yakimenko.

The subject of the present invention is an arrangement for keeping the pressure equal in the separatory columns or electrode spaces of electrolytic cells for the production of hydrogen and oxygen by electrolyzing water under a pressure of 5-15 atmospheres. The fundamental difficulty which inventors of this type of installation have to surmount is that posed by the necessity of establishing a precisely equal pressure on both sides of the diaphragm separating the oxygen cell from the hydrogen cell. The authors of the present claim have succeeded in satisfactorily solving that problem by applying a combined hydraulic and mechanical regulating appliance, the details of which can be seen from the appended figure.

The oxygen and hydrogen pipe conduits which lead from the corresponding spaces of the cell are connected with two separatory columns 1 (one for oxygen and the other for hydrogen.) The two columns are connected at the bottom with each other and by means of a common pipe line and branches are connected with all cells. The separatory columns are equipped with cooling coils for the purpose of cooling the electrolyte.

From the separatory columns 1 the gases enter the scrubbers 2. The scrubbers 2 are also connected with each other at the bottom and by means of the common pipe line 4 with the cells. In view of the fact that the gases from the separatory columns bubble through the layer of liquid in the scrubbers while the nozzles of the gas distributors 8 are at the same height in both scrubbers, the level of liquid in the separatory columns is kept constantly at the level of the gas distributors' outlets as long as the gas distributors are even slightly submerged in the liquid contained in each of the scrubbers. At the same time, the pressure in both separatory columns is kept exactly equal.

SECRET

If a pressure differential, however slight, arises in the outer network or the receivers which are located behind the regulators, a difference in the liquid levels is created in the scrubbers, the latter being communicating vessels. The pressure remains equal in the separatory columns, because any difference in pressure would be fully compensated by the difference in levels of liquid and liquid heads in the scrubbers through which the gases are bubbled.

Pressure regulators 3 are connected directly with the scrubbers in such a manner that each pressure regulator is connected with its scrubber. The rise or fall of the water level in the scrubber brings about a corresponding change of level in the regulator. When the water level rises, the float activated valves 5 shut off the discharge of gas going out of the system. When the water level drops, the gas discharge valve is opened.

Whenever even a small pressure differential is produced in the outer network, the levels rise in the scrubber and regulator which are exposed to the lower pressure. As a result, the discharge of the gas in question is shut off. Any further lowering of gas pressure in the outer network of that gas has no longer any effect on the work of the installation. On the contrary, the float operated valve for the other gas is completely open. When the pressure begins to rise in the shut scrubber and regulator (as it must, because more gas develops in the electrolytic cell), the float activated valve will open a little, by reason of its lowered liquid level, letting out some gas. Thus, both the hydraulic method (by means of communicating vessels) and the mechanical method (by means of automatic opening or closing of discharge valves to a certain degree through the action of float regulators) are being applied for pressure regulation.

The pipe lines which connect the regulators with the receivers and outer network are equipped with non-return valves 6.

The proposed method of regulation is suitable for very extensive pressure fluctuations in the outer network. With the new method of pressure regulation, installation based on the application of electrolysis gases in the cutting and welding of metals becomes feasible, this being an application in which the use of gases is very uneven and consequently involves considerable fluctuations.

SECRET

Subject of the invention

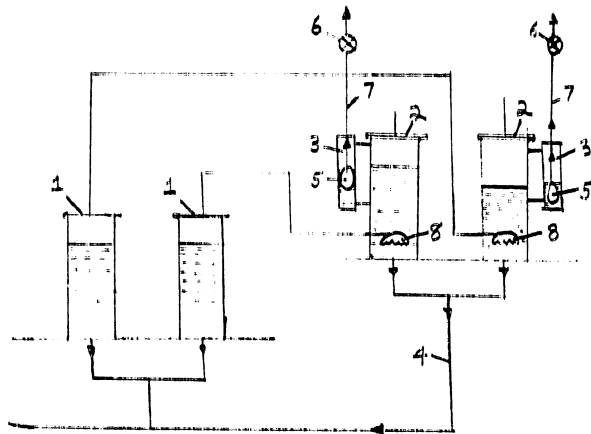
1. Appliance for keeping the gas pressure equal in two separatory columns communicating at the bottom or two electrode compartments of an electrolytic cell and for keeping the level of liquid constant in the separatory columns independently of pressure fluctuations in the outer network, the invention having the following distinguishing marks: the gas scrubbers 2 are connected with chambers 3 containing floats 5, the shafts 7 of which are connected with gas discharge valves 6; the gas distributors (bubblers) 8 are disposed on a common level in the scrubbers.
2. Another distinguishing mark, as far as the execution is concerned, is the fact that the separatory columns are equipped with cooling coils.

[Diagram follows]

SECRET

SECRET

Certificate of Authorship No 51206 of
L.S. Genin , A.M. Koloskov , V.M. Ramm,
N.M. Solomatina, V.G. Khomyakov, and L.M. Yakimenko.



- E N D -

- 4 -

SECRET